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Discovery of the Australian diving beetle *Neobidessodes mjobergi* (Zimmermann, 1922) in New Guinea (Coleoptera, Dytiscidae, Hydroporinae)

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Abstract

The diving beetle genus *Neobidessodes* Hendrich & Balke, 2009 contains 10 species. Nine of them were considered endemic to Australia, one of them to the Trans Fly Savanna and Grasslands Ecoregion of New Guinea island. Here, we provide the first report of one of the Australian species, *Neobidessodes mjobergi* (Zimmermann, 1922), from the same region of New Guinea. We suggest that more focused research will reveal the occurrence of far more Australian diving beetle species in that region of New Guinea.

Keywords

Aquatic Coleoptera, Australian fauna, savanna and grassland region

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Introduction

Diving beetles (Coleoptera, Dytiscidae) are a comparably well-studied family of beetles. There are more than 4,500 known species (Nilsson and Hájek 2021), occupying a large variety of aquatic habitats including ground water, rivers and streams, peat bogs, hypersaline as well as hygropetric habitats, ponds, puddles and lakes. In general, they can easily be collected and are often used as a study group for ecological, conservation, biogeographic and evolutionary research (Balke and Hendrich 2016; Miller and Bergsten 2016). The diving beetle genus *Neobidessodes* Hendrich & Balke, 2009 belongs to the tribe Bidessini of the subfamily Hydroporinae—the tribe comprising one of the world's smallest known dytiscids (body length 0.9–4.8 mm). *Neobidessodes* is endemic to the Australian Region and contains nine Australian and one southern New Guinean species (Hendrich and Balke 2011; Hendrich et al. 2009). In 2011, a team of students and scientists from the Cenderawasih University (Waena campus, Jayapura, Papua), namely Evie Lili Warikar, Ani Yoslinda Waromi, and the first author, visited the savanna and grassland region in the very south of Papua. The goal was to conduct an initial study of the aquatic invertebrate fauna in that region, which, unlike the vast rest of Papua, strongly resembles savanna and grassland

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Figure 1. *Neobidessodes mjobergi*. Habitus, dorsal view; length of beetle 2.6 mm.

regions of Australia. Based on this initiative, we report the discovery of the northern Australian diving beetle *Neobidessodes mjobergi* (Zimmermann, 1922) in New Guinea.

Methods

This work is the result of a field study conducted by members of the Department of Biology, Universitas Cenderawasih, Waena, Papua, Indonesia. Specimens were collected by hand, using plastic kitchen strainers available from local supermarkets and plasticware stores.

Images were taken with a Canon EOS 5DS camera fitted with a 10× Mitutoyo lens, attached to a Stackmaster macro rail (Stonemaster: https://www.stonemaster-onlineshop.de/). Illumination was with three LED segments SN-1 from Stonemaster. Image stacks were generated using the Stackmaster macro rail (Stonemaster), and images were then assembled with the computer software Helicon Focus 4.77TM.

Voucher specimens are stored in the Koleksi Serranga Papua (KSP), Department of Biology, Universitas Cendrawasih, Waena, Papua, Indonesia as well as Museum Zoologicum Bogoriense (MZB), Cibinong, Indonesia.

Results

***Neobidessodes mjobergi* (Zimmermann, 1922)**
Figure 1

Known localities. AUSTRALIA, Northern Australia, from the Kimberley region, Arnhemland, Kakadu National Park to northern Queensland (Hendrich et al. 2009) (Fig. 2D).

New record. INDONESIA – **Papua** • Merauke, Wasur, pools; −07.6743°, 140.4543°; 20 m alt.; 15–16.X.2011; UNCEN team leg.; 2 individuals, sex indet., UNCEN_KSP_COL_001 and 002.

The specimens were collected during the dry season in an area that would be widely inundated during the wet season. They were in a rest pool, its bottom with very thick layer of leaves (up to 70 cm) and its margins with an area of wet leaves which form small open water once stepped on. The surroundings were open, half-shaded savanna forest (Fig. 2A–C).

Identification. The species was identified based on the revision of Hendrich et al. (2009). We here provide a habitus photo of the species, which allows reliable identification. *Neobidessodes mjobergi* differs from most congeners by its lack of pronotal striae and the black base of pronotum. It shares these features only with *N.*

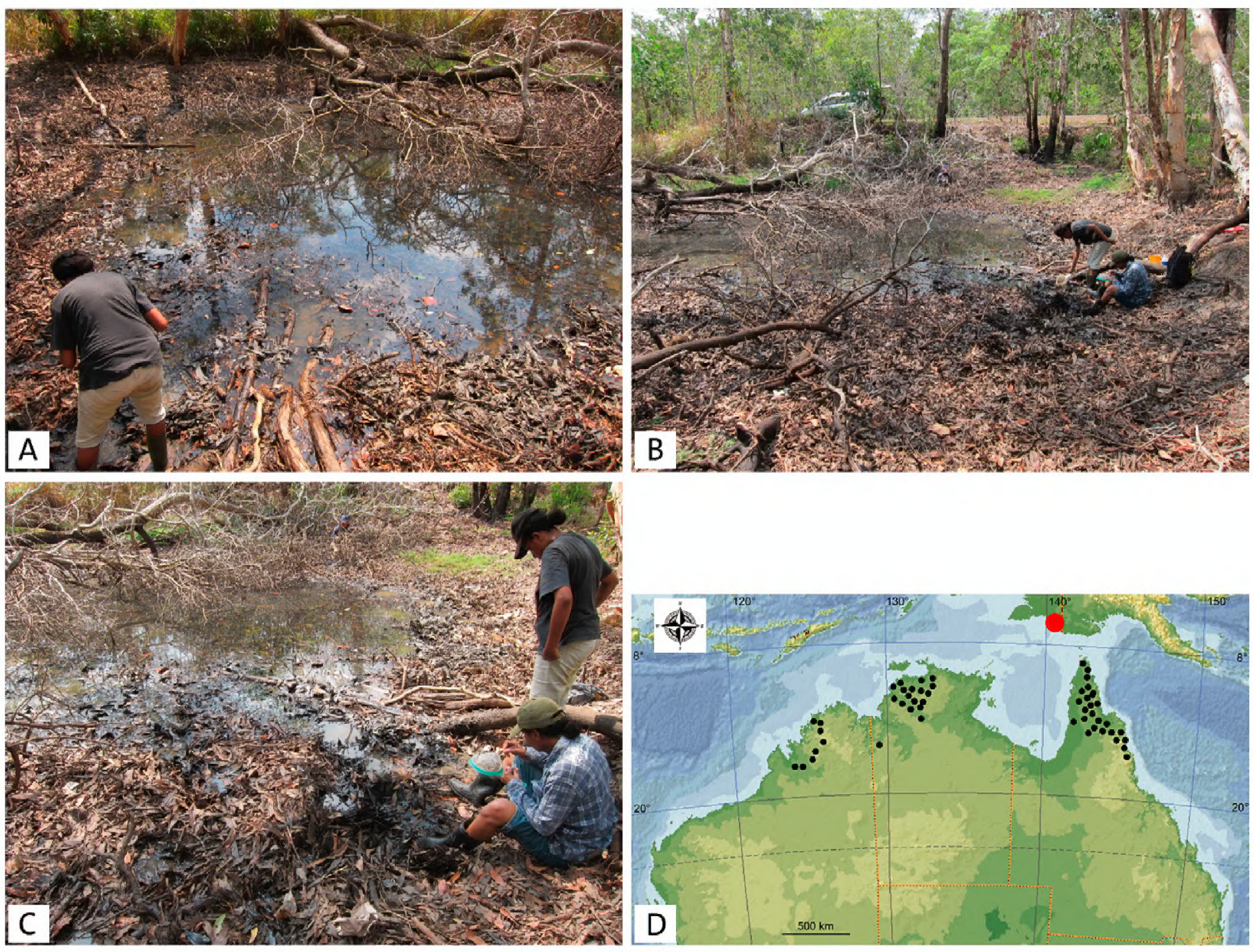

Figure 2. A–C. *Neobidessodes mjobergi*. Habitat and collecting work in progress. **D.** Distribution map based on Hendrich et al. (2009); black dots are localities in Australia, and the red dot is the new record for New Guinea.

thoracicus Hendrich & Balke, 2009, from which it differs by smaller size (body length 2.55–2.65 mm versus 2.75–2.90 mm), as well as habitus: lateral outline evenly curved across pronotal/elytral junction (i.e., pronotum widest at base) in *N. mjobergi*, versus lateral outline slightly disrupted at pronotal posterior angle (i.e., pronotum widest slightly before base) in *N. thoracicus*.

Discussion

We provide the first record of the northern Australian diving beetle *Neobidessodes mjobergi* in New Guinea. The collecting site is situated in the Trans Fly Savanna and Grasslands Ecoregion, part of the global tropical and subtropical grasslands, savannas, and shrublands Biome (Dinerstein et al. 2017). The dry seasonal climate with open grassland and open Eucalypt forest, unlike any other region of New Guinea, very much resembles the northeastern part of Australia. The Trans Fly Savanna and Grasslands remain entomologically little explored, and this is especially true for aquatic invertebrates. Based on the outcome of our initial survey, we suggest more focused fieldwork in that area, most suitably during the dry season where aquatic insects are easily sampled from residual water bodies. Recent development in the southern part of New Guinea poses increasing anthropogenic threats, so that field work should also help to identify conservation priorities.

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Authors' Contributions

SS and MB coordinated the research cooperation. SS organized fieldwork, permits and collected the specimens. LH and MB identified the species. All authors wrote the manuscript. All authors corrected, revised, and discussed the data.

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